

## **Examiner's Arguments and Responses by Applicant**

### **Examiner's Statements Pertaining to the IDS**

The EPA Project Summary listed on the IDS filed 7/13/04, i.e., "Effect of Recycling...", has not been considered because the copy filed with the IDS was illegible.

The Browner speech is not probative of the state of the art at the time the invention was made because the speech was delivered on 10/17/1997, after applicant's effective filing date of 9/26/1996. Accordingly, applicant's arguments, if any, based on this reference alone are unpersuasive.

*The Examiner makes similar arguments in relation to the: Novak and Bivins article published in 2000, EPA Clean Water Act Article published in 2003 and the Sierra Club article published in 2004.*

### **Applicant's Response**

The EPA project Summary has been resubmitted herein. Applicant has taken special care to be sure that a very legible copy of said article is enclosed.

Applicant understands the position of the Examiner in the remaining references.

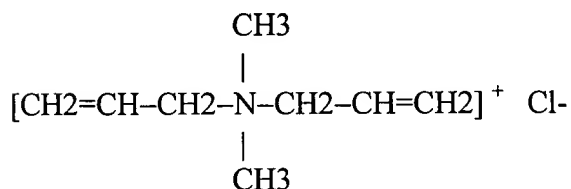
### **Examiner's Argument's Pertaining to 35 USC § 112 - 2<sup>nd</sup> paragraph, Claims 2 and 3**

Claims 2-3 are rejected under 35 USC §112, second paragraph for failing to particularly point out and distinctly claim the subject matter for which patent protection is sought. In claim 2, it is unclear what a "(DADMAC) family of compounds" is because DADMAC is a unique compound. Similarly, in claim 3, it is unclear what an "(epi-DMA)" family of compounds is because epi-DMA is a unique compound.

Applicant at page 35 argues that the DADMAC "family of compounds" would cover for example, di-allyl, di-methyl ammonium chloride compounds varying in the chain length of the "allyl" group, i.e., wherein the "allyl" group would have from 4 to 6 or 7 or 8 carbons, or differing in the alkyl groups on the amine, e.g., di-methyl amine could be methyl-methyl amine or methyl ethyl amine or ethyl amine or ethyl methyl amine or methyl-propyl amine, and so on.

Applicant's arguments presupposes that DADMAC is a description of a genus of compounds rather than a single compound. The examiner and the applicant differ on this point.

The examiner's position remains that di-allyl, di-methyl ammonium chloride is but a **single** compound. Specifically, it is a compound wherein each of the two "allyl" groups ("di-" allyl) is a 2-propenyl group bonded directly to the nitrogen of the nitrogen atom of the ammonium group, as shown below:



Moreover, if DADMAC meant di-alkyl ammonium chloride, then the abbreviation would have been DADAAC right? Applicant himself defined DADMAC as "di-allyl-di-methyl ammonium chloride."

Similar arguments apply to the epi-DMA "family of compounds" point. The examiner's position remains that epi-DMA stands for epichlorohydrin di **methyl** amine (see applicant's patent for this definition as well). If epichlorohydrin di-alkyl amine were intended, the abbreviation would have been epi-DAA, right?

It is helpful, the examiner feels, to review the context in which the "DADMAC variety" and "epi-DMA variety" phrases were used in the application. What applicant said in the original application was:

Examples of polymeric quaternary ammonium compounds are the di-allyl di-methyl ammonium chloride (DADMAC) variety and the epichlorohydrin di-methyl amine (epi-DMA) variety.

The point that Applicant was making was that suitable "polymeric quaternary ammonium compounds" suitable for use in the invention come in **two** varieties, namely, firstly, the single compound di-allyl di-methyl ammonium chloride and, secondly, the compound epichlorohydrin di-methyl amine. This interpretation is supported by another statement by applicant in the patent: Applicant stated:

Di-allyl di-methyl ammonium chlorides (DADMAC) and epichlorohydrin di-methyl amine (epi-DMA) are two preferred polyquaternary amines used in sludge dewatering. Both of these polyquaternary amine moieties have been found to provide sites for the dewatering of sludge from the thermophilic digestion process.  
(emphasis added)

If applicant understood DADMAC to describe a genus of compounds (plural) and epi-DMA to describe a genus of compounds (plural), then he would not have referred to them as "**two**

preferred polyquaternary amines” or the phrase “**both** of these polyquaternary amine moieties” (emphasis added).

In contrast, let’s see how another artisan (Hassick 5035808, col 2) addressed this issue:

Any water soluble di C<sub>1</sub> – C<sub>8</sub> alkyl diallyl ammonium polymer can be used with ferric sulfate. The preferred polymers are polydimethyl diallyl ammonium chloride (polyDADMAC), polydiethyldiallyl ammonium chloride (polyDEDAAC), polydimethyl diallyl ammonium bromide (polyDEDAAB). The most preferred dialkyl diallyl ammonium polymer is a homo polymer of dimethyl diallyl ammonium chloride.

The confusion of just what is meant by the “epi-DMA family of compounds” is exacerbated by varying the alkyl groups on the amine, i.e. [sic, “e.g.,”?] di-methyl amine could be methyl-methyl amine or methyl-ethyl amine...” The confusion of this remarks suggests that “di-methyl amine” and “methyl-methyl amine” differ with respect to the alkyl group. Such is not the case: Di-methyl amine is the very same compound as methyl-methyl amine.

Attempts after the fact of preparation and filing of the application 09/05870 which matured into the patent now the subject of reissue to squeeze additional substituted ammonium chloride compounds other than epi-di-methyl amine from the stone of “polyquaternary ammonium compound” is not supported by the original disclosure.

### **Examiner’s Argument’s Pertaining 35 USC § 112 – 1’s Paragraph, Claims 2 and 3**

Claims 2-3 are rejected under 35 USC Sec. 112, first paragraph, for failure of the application as filed to provide written support for a “DADMAC family of compounds” or an “epi-DMA family of compounds.” As noted above, the application supports two (and only two polymeric quaternary ammonium compounds: the di-allyl di-methyl ammonium chloride (DADMAC) variety or type of a polymeric quaternary ammonium compound, and the epichlorohydrin di-methyl amine (epi-DMA) variety or type of a polymeric quaternary ammonium compound.

### **Applicant’s Response to Both Argument’s Pertaining to 35 USC 112**

Applicant has reworded Claims 2, 3 and 20 to state:

2. The method for dewatering thermophilic biological sludge according to claim 1, wherein the polymeric quaternary ammonium compound is of the di-allyl di-methyl ammonium chloride (DADMAC) variety.

3. The method for dewatering thermophilic biological sludge according to claim 1, wherein the polymeric quaternary ammonium compound is of the epichlorohydrin di-methyl amine (epi-DMA) variety.

20. The sludge of claim 19, wherein the polyquaternary ammonium compound is of the DADMAC variety and/or of the epi-DMA variety.

In all three claims the words "family of compounds" has been replaced with "variety." The words "DADMAC variety" and "epi-DMA variety" have support in many locations of the specification. Specifically, the abstract states:

"The primary component in the five versions is a polyquaternary amine, preferably of the di-allyl di-methyl ammonium chloride (DADMAC) variety and from the epichlorohydrin di-methyl amine (epi-DMA) variety."

This description is repeated again within the Description of the Prior Art, col. 1, lines 17 through 21:

"Examples of polyquaternary ammonium compounds are the di-allyl di-methyl ammonium chloride (DADMAC) variety and the epichlorohydrin di-methyl amine (epi-DMA) variety."

And again, within the Detailed Description of the Preferred Embodiment, col. 5, lines 7 through 10:

"The primary component in the five versions is a polyquaternary amine, preferably of the di-allyl di-methyl ammonium chloride (DADMAC) variety and from the epichlorohydrin di-methyl amine (epi-DMA) variety."

Applicant has repeatedly provided an embodiment of a "polyquaternary amine."

- "The primary component in the five versions is a polyquaternary amine."
- "Examples of polyquaternary ammonium compounds are," and
- "The primary component in the five versions is a polyquaternary amine."

Applicant has **nowhere within the specification placed a restriction or a limitation** on said "polyquaternary amine." Referring to Webster's Dictionary, the word example is defined as:

**1:** one that serves as a pattern to be imitated or not to be imitated,

- 3: a particular single item, fact, incident, or aspect that is representative of all of a group or type,
- 4: a parallel or closely similar case esp. when serving as a precedent or model,
- 5: an instance (as a problem to be solved) serving to illustrate a rule or precept or to act as an exercise in the application of a rule

Applicant also repeatedly defined a "preferred" embodiment of the "DADMAC variety" and the "epi-DMA variety." **Applicant has not limited either the embodiment or the preferred embodiment to DADMAC or to epi-DMA.**

Further, a literal interpretation in the above i.r.t. DADMAC and epi-DMA means exactly what is stated, "preferably of the di-allyl di-methyl ammonium chloride (DADMAC) variety and from the epichlorohydrin di-methyl amine (epi-DMA) variety;" therefore, "DADMAC variety" is "preferred" and "epi-DMA variety" is "preferred." The term "preferred" in a patent specification is not to be limiting, but to be directing of the reader to a "preferred" embodiment. Webster's Dictionary defines the word "prefer" as:

- 1: to promote or advance to a rank or position,
- 2: to like better or best, and
- 3: to give priority.

Further yet, the Applicant's preferred embodiment "of the DADMAC variety" is inclusive of DADMAC not just DADMAC. And, Applicant's preferred embodiment "of the epi-DMA variety," is inclusive of epi-DMA, not just epi-DMA. Even if the Applicant had chosen to limit the specification to a preferred embodiment (wherein preferred is not limiting) of DADMAC or of epi-DMA, then Applicant would not have included the word "variety" as the noun describing each preferred embodiment of DADMAC and epi-DMA. As previously presented to the Examiner and presented herein again for emphasis, Webster's Dictionary defines the word "variety" as:

- 1: the ability or state of having different forms or types,
- 2: a number or collection of different things esp. of a particular class,
- 3a: something differing from others of the same general kind, and
- 3b: any of various groups of plants or animals ranking below a species.

The Applicant stated “**DADMAC variety**” and Applicant stated “**epi-DMA variety**” while stating said preferred varieties under a general embodiment of polyquaternary amine (emphasis added).

**There are no words in these three statements or elsewhere within the specification to indicate any limit to: polyquaternary amine, DADMAC variety or epi-DMA variety.**

As communicated to the Examiner on many occasions, there are many variants of the polyquaternary amine moiety. These are known in the art, have been presented by the Applicant and have been recognized by the Examiner in his quotation from Hassick '808, wherein Hassick only presents a few **variants** of the DADMAC moiety. DADMAC is but one of many potential polyquaternary amine moiety variants.

Applicant does agree that the Hassick '808 reference is descriptive of the **specific** types of DADMAC **as described by and referred to by Hassick**. However, the Applicant is in stark contrast to Hassick as Applicant has the general embodiment of “a polyquaternary amine.” Hassick does not. While DADMAC is a polyquaternary amine, DADMAC is only one of many polyquaternary amine moieties of the DADMAC variety; the same argument applies to the epi-DMA variety.

In a variation of the same descriptor, the word family is used in col. 8, lines 38 through 40:

“In method five as well, the polyquaternary ammonium compounds are from DADMAC family or from epi-DMA family.”

Further, Applicant presents in col. 4, lines 37 through 42:

“It is to be understood that the descriptions of this invention are exemplary and explanatory, but are not restrictive, of the invention. Other objects and advantages of this invention will become apparent from the following specification and from any accompanying charts, tables, examples and drawings.”

And, Applicant states in the same column lines 54 through 61:

“The present invention is described in connection with one or more preferred embodiments. However, it should be understood that the invention is not limited to those embodiments. In contrast, the invention includes all

alternatives, modifications and equivalents as may be included within the spirit and scope of the specification and of the appended claims.”

And, Applicant states in col. 12, lines 12 through 50:

“Certain objects are set forth above and made apparent from the foregoing description and examples. However, since certain changes may be made in the above description and examples without departing from the scope of the invention, it is intended that all matters contained in the foregoing description and examples shall be interpreted as illustrative only of the principles of the invention and not in a limiting sense. With respect to the above description and examples then, it is to be realized that any descriptions, drawings and examples deemed readily apparent and obvious to one skilled in the art and all equivalent relationships to those stated in the specification are intended to be encompassed by the present invention.

Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention. It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention, which, as a matter of language, might be said to fall in between.”

Further, as evidenced in the file history of Haase '750, the specification of the parent application, 08/721,557, makes the same presentations as in the '750. Specifically, in the '557 application page 2, lines 11 through 13 states:

“Examples of polyquaternary ammonium compounds are the di-allyl di-methyl ammonium chloride (DADMAC) variety and the epichlorohydrin di-methyl amine (epi-DMA) variety.”

And, the abstract states:

“The primary component in the five versions is a polyquaternary amine, preferably of the di-allyl di-methyl ammonium chloride (DADMAC) variety and from the epichlorohydrin di-methyl amine (epi-DMA) variety.”

Therefore, Applicant would like to respectfully present to the Examiner that Applicant **is not attempting to** “squeeze additional substituted ammonium chloride compounds and additional substituted di-alkyl amine compounds or epi-dialkyl amines other than epi-di-methyl amine from the stone of ‘polymeric quaternary ammonium compounds.” Rather, Applicant is asserting that the scope of protection he seeks is

supported in the specification. Claims 2 and 3 (as well as 20), as amended herein, are supported by the specification in many cited locations.

Further, in an effort to go beyond the above definitions within the English language, Applicant would like to point the Examiner to a secondary consideration, the Declaration of Mr. David Breslin, which describes knowledge within the art in 1996. In his declaration, Mr. Breslin states in paragraph 5:

"I have personal knowledge of industry capabilities and knowledge relating to the manufacture of variants of DADMAC and variants of Epi-DMA. Within this industry, there are easily manufactured equivalents which are known variants or variations to these chemistries."

And, states in paragraph 6:

"DADMAC is and has been commonly manufactured by the reaction of allyl chloride with a dimethyl (methyl-methyl) amine. Variations on this theme have been known by those of ordinary skill since the 1980's and can be easily manufactured, for example, by varying monomer chain length without changing the quaternization moiety. For example, the methyl-methyl amine could be methyl-ethyl amine or ethyl-ethyl amine, etc. Also, while not as easily accomplished, the chain length within the allylic moiety can be altered as well."

And, states in paragraph 7:

"Epi-DMA is and has been commonly manufactured by the reaction of epichlorohydrin with a methyl-methyl amine. Variations on this theme have been known by those of ordinary skill since the 1980's and can be easily manufactured, for example, by varying monomer chain length without changing the quaternization moiety. For example, the methyl-methyl amine could be methyl-ethyl amine or ethyl-ethyl amine, etc. Also, the chain length within the epichlorohydrin moiety can be altered as well."

And, states in paragraph 10:

"to one of ordinary skill in the art, the term: "of DADMAC variety" would not be limited to DADMAC alone, "of epi-DMA variety" would not be limited to epi-DMA alone, "DADMAC family" would not be limited to DADMAC alone, "epi-DMA family" would not be limited to epi-DMA alone, "DADMAC family of compounds" would not be limited to DADMAC alone, and "epi-DMA family of compounds" would not be limited to epi-DMA alone."

Further yet, in an effort to address the detail within the Examiner's rejection, Applicant would like to state that he is in agreement with the Examiner that **DADMAC itself**



**is a single compound; however, the preferred embodiment is not limited to DADMAC itself. DADMAC variety and Epi-DMA variety** are described as preferred embodiments, wherein DADMAC is a species within the genus "DADMAC variety" and epi-DMA is a species within the genus "epi-DMA variety." The Applicant agrees with the Examiner that di-alkyl ammonium chloride could be abbreviated DADAAC; however, such a presentation by the Examiner utilizing the DADAAC example is overly restrictive and not in concert with the specification when the specification states "of the DADMAC variety." And, it is perfectly reasonable to conclude that DADAAC is of the DADMAC variety, especially as variety is used in the specification, defined by Webster and interpreted in the industry.

Also, Applicant agrees with the Examiner that epichlorohydrin di-alkyl amine could be abbreviated epi-DAA; however, such a presentation by the Examiner utilizing the epi-DAA example is overly restrictive and not in concert with the specification when the specification states "of the epi-DMA variety." And, it is perfectly reasonable to conclude that epi-DAA is of the epi-DMA variety, especially as variety is used in the specification, defined by Webster and used in the industry.

Further also yet, in an effort to address the detail within the Examiner's rejection, Applicant would like to state that he is not required to write a patent specification in a manner that is consistent with another inventor. Hassick '808 **does not set a standard** of specification preparation. Applicant can, respectfully, find no reference within the MPEP requiring the specification style of Hassick '808. On the contrary, Applicant went to uspto.gov and performed a search for the word "variety" which culminated in **695,969** issued patents since 1975 wherein the word variety is used. Specifically, the recently issued U.S. Pat. No. 6,848,117 states in embodiment 9:

The connection between the video server apparatus and the terminal apparatus may take a *variety* of form. For example, a plurality of terminal apparatuses may be connected to a single video server apparatus, a plurality of terminal apparatuses may be connected to a plurality of video server apparatuses, or a single terminal apparatus may be connected to a single video server apparatus. (emphasis added)

Also, the recently issued 6,847,897 states in the Detailed Description section:

"Preferred embodiments are described herein with respect to one example of a system yielding biological response signals, although it is to be appreciated that the scope of the

preferred embodiments is not so limited and may be applied to any of a *variety* of experimental environments involving biological response signals...” (emphasis added)

And further yet also, in an effort to address the detail within the Examiner’s rejection, Applicant would like to address the Examiner’s rejection, wherein the Examiner states:

“The confusion of just what is meant by the “epi-DMA family of compounds” is exacerbated by Applicant’s remark that “a family of compounds can be prepared by varying the alkyl groups on the amine, i.e. [sic, “e.g.”?] di-methyl amine could be methyl-methyl amine or methyl-ethyl amine...” The confusion of this remarks suggests that “di-methyl amine” and methyl-methyl amine” differ with respect to the alkyl group. Such is not the case: Di-methyl amine is the very same compound as methyl-methyl amine.”

In the filing of this RCE to 09/866,145, Applicant was not attempting to create any confusion and thanks the Examiner for identifying the Applicant’s typographical error. The Applicant corrects herein for clarity:

“a family of compounds can be prepared by varying the alkyl groups on the amine, e.g. di-methyl amine, which can also be described as methyl-methyl amine, wherein said methyl-methyl amine could be replaced with the variants of methyl-ethyl amine or ...”

Applicant has respectfully traversed the Examiner’s rejections, objections and limitations. Applicant requests allowance of claims 2 and 3 (as well as 20) as amended herein.

#### **Examiner’s Rejection Pertaining to New Matter**

Claim 9 is rejected under 35 USC Sec. 112, first paragraph, for failure of the original specification to describe the claimed invention. The recited ratio range of 50 ppm:1 % - 350 ppm:1 % is not supported by the range of 50 ppm:1 % - 300 ppm:1%  
(col 6 line 53)

#### **Applicant’s Response**

Oops! Applicant apologizes to the Examiner for that typographical error and thanks the Examiner for his thoroughness. Applicant has corrected the recited ratio range to read “50 ppm: 1% - 300ppm:1%.”

Applicant has respectfully traversed the Examiner's rejection. Applicant requests allowance of claim 9 as amended herein.

### **Double Patenting**

Claims 1 – 13, 15 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 – 14, 16 of U.S. Patent No. 5846435 to Haase in view of USP 3472767 to Lees. ...

Claims 16 – 18, 21 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 15 of U.S. Patent No. 5846435 to Haase in view of USP 3472767 to Lees. ...

Claims 19 – 20 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 15 of U.S. Patent No. 5846435 to Haase in view of USP 3472767 to Lees, as noted above, further in view of Sorensen '433. ...

### **Applicant's Response**

Applicant has attached as part of this Amendment a terminal disclaimer in compliance with 37 CFR 1.321(c). Filing of said terminal disclaimer, respectfully transverse all of the Examiner's double patenting rejections, thereby placing claims 1 – 13, 15, 16 – 18, 19 – 20 and 21 in a condition for allowance.

### REMARKS

Applicant would like to direct the Examiner to a co-pending application, specifically 90/005,710, wherein Applicant and the Examiner were unable to agree on the use of the term “DADMAC variety” and the term “Epi-DMA variety”. In that proceeding the Examiner stated a position in his 08/10/05 office action on pages 3 and 4 of said office action:

“The [E]xaminer agrees with applicant/owner that there exist many variants of the polyquaternary amine moiety, citing USP 5035808 to Hassick (page 24 or 42), but that fact does not illuminate what compounds *other than* DADMAC itself are recognized in this art as being of the ‘DADMAC variety.’ The prior art, e.g., Hassick ‘808, provides evidence that the art recognizes the existence of a variety of ‘water soluble di C1 – C8 alkyl diallyl ammonium polymer[s]’ (Hassick ‘808 column 2 line 62 – column 3 line 2), but that recognition does not support applicant’s position that there is a recognition in the art of what is meant by the expression, ‘a compound of the di-allyl di-methyl ammonium chloride (DADMAC) variety.’ Importantly, Hassick ‘808 is referring to a genus of “di[-]alkyl diallyl ammonium polymers” without specification of the identity of the halide ion and without specific identification of the dialkyl group. In contrast, applicant’s terminology specifies the identity of the halide ion (chloride) and the alkyl group (di-methyl) to the point that a single compound (DADMAC) is left. At issue is what compounds other than DADMAC itself of ‘of the DADMAC variety.’ There is no recognition in the art of record what compounds (other than DADMAC) are species within applicant’s alleged genus. Hassick ‘808 is evidence that DADMAC is a species of the genus of dialkyl diallyl ammonium polymers, not that there is recognition in the art of what compounds other than DADMAC itself belong to the genus of ‘compounds of the DADMAC variety.’”

As Applicant’s main concern is not to create any position of “prosecution estoppel” relating to known equivalents of DADMAC and Epi-DMA, should the Examiner not be persuaded by Applicants arguments as previously presented herein, Applicant would like to ask the Examiner to ascertain if the above, previously stated position of the Examiner may apply to this proceeding. If then, the arguments previously presented herein are not persuasive to the Examiner for use of the phraseology “DADMAC variety” and “Epi-DMA variety” and the Examiner is able to apply said previously stated position of the Examiner to this proceeding, then Applicant would be able to come to agreement with the Examiner regarding the wording of claims 2, 3 and 20 herein. More specifically, then, Applicant would be in agreement with the Examiner to reword claims 2, 3 and 20 such that the phrase “di-allyl di-methyl ammonium chloride (DADMAC) variety” would be changed to “di-allyl di-methyl ammonium chloride (DADMAC)” and the phrase “epichlorohydrin di-methyl amine (Epi-DMA) variety” would be changed to “epichlorohydrin di-methyl amine (Epi-DMA)”.

**CONCLUSION**

Applicant requests that this amendment be entered. This amendment places all of the pending claims in a condition for allowance. The proposed amendments to the claims do not raise any new matter issues and no additional searching would be required. Additionally, Applicant requests that in view of this fact, the amendment be entered, and after due consideration of the facts presented herein, the claims be allowed and a certificate be issued.

Although the above discussion provides sufficient evidence for allowance of the claims and the issuance certificate, Applicant is including secondary considerations in a Declaration from Mr. David Breslin, for the Examiner's review, should the Examiner deem necessary. The Declaration shows that the term "of the DADMAC variety" and "of the Epi-DMA variety" would communicate to one of ordinary skill in the art variants upon the DADMAC moiety and variants upon the Epi-DMA moiety, respectively.

Respectfully submitted,



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